

TITLE OF INVENTION

Protection device

TECHNICAL FIELD

[0001] The present invention relates to devices for the protection of in particular smaller electronic equipment like portable computers (notebooks), PDAs (Palm etc.), also of documents and other office supplies against effect of light, warmth, rain, dust and/or wind. It relates further to very light weight, self upstanding and very portable devices.

BACKGROUND ART

[0002] In general, prior art screen glare reducing devices are attachable on the screen and offer protection against ambient light, for example US 3.062.917, US 4.314.280, US 4.569.572, US 6.356.439, DE 297 10 815 U1, DE 299 03 985 U1. These devices have the disadvantage that they must be attached and/or mounted with more or less large effort on a monitor. A further disadvantage consists of the fact that the equipment is only protected against sun exposure at the display, for the purpose of a glare reduction. The equipment is not protected against the sun exposure and the associated heat development. Furthermore no protection against further environmental influences is given.

[0003] WO 02/098763 A1, which forms the starting point of the present invention, discloses a partially collapsible enclosure. The upper protecting part of this enclosure has a conical form and therefore does not offer sufficient protection from ambient light, and/or further environmental influences. In order to avoid glare by reflected light of the operators arms and clothes towards the display of a notebook, an additional glare guard is proposed, with a plane arranged diagonally between keyboard and display. This glare shield isn't however able to avoid neither these reflections effectively, nor the glare due to directly breaking in light. Beyond that, this glare guard could be disturbing during the operation of the notebook by impairing the visibility of the keyboard or the display. The objective to give an enclosure for transport as backpack and carry handle works oppositely to the issue of providing enhanced visibility and protecting from weather during operation. A further disadvantage of this enclosure is that it has to be mounted at least of sheeting, struts, glare guard. In addition it is only partially collapsible. It can only be folded down almost flat but without further reduction of the dimensions of its largest surfaces.

[0004] Tent-like devices, which consist of one or more self-supporting, foldable and twistable panels are well-known since many years. These panel members have a fabric material held in the unfolded condition, under constant biaxial tension by an integrated one piece frame with a closed geometry. The frame is in such a manner flexible that it can be twisted in three circular and/or elliptical loops, in order to make the dimensions smaller for transport. US 3.675.667 first discloses such a structure comprising only of one curved panel member to give a tent.

[0005] US 4.815.784 discloses for the first time such a one piece structure of this kind with a plurality of panel members, firmly connected to one another, for an automobile sunshield. In order to collapse the structure the panel members must first be folded one on top of the other and then together twisted into a collapsed configuration of a much smaller series of loops and layers of fabric. Since then several varieties of this construction principle for applications, like tents, playgrounds etc., have been presented.

[0006] US 5.038.812 and EP 0,487,642 B2 present e.g. a structure with several panel members, which are partly self-supporting. The panel members are circularly connected with one another in the range of a cone top and limited in such a manner with a floor panel or straps that the device becomes self-supporting. This structure has the disadvantage that it proposes saddle-shaped panel members, which have limited practical use. Besides, the panel members have to be kept bent through constant tension in order to maintain structural stability. Additional aids, like a limiting, floor panel or straps are needed, in order to keep the panel members under tension towards each other. Only by this remains the device upstanding.

[0007] GB 22 93 620 discloses a tent with three or several panel members. These do not have a saddle form and therefore it is self supporting. This construction is also conical and has, as all before mentioned devices a geometrical form and further characteristics, which are not suitable for the protection of electronic equipment, in particular while the enclosed equipment is used. Protection devices with a comprehensive protection from several different environmental influences, with at the same time provide good usability of a equipment, in particular a notebook, arranged therein, are not known.

[0008] It is the object of the present invention to provide, an improved, universally applicable protection device which is easy to handle, particularly designed to provide the protection while an enclosed notebook is in use, in particular under strong ambient light, and having geometrical and constructional characteristics, which make this possible without a handicap. This task is solved by a protection device according to claim 1, a protection arrangement according to claim 28, or a Method according to claims 29 and/or 30. Favourable further embodiments are the subject of the subclaims.

SUMMARY OF THE INVENTION

[0009] The proposed protection device has several advantages:

[0010] The protection device offers comprehensive protection against different environmental influences, like light, warmth, water, rain, dust and/or wind. It offers protection, while the devices are temporarily out of use and exposed to the environmental influences. This is obtained by the fact that the equipment can be covered preferably completely and the material is preferably water-resistant, waterproof, opaque, reflecting and/or flame resistant or incombustible .

[0011] Apart from the protection of the equipments the protection device enables also a best possible problem-free operating of the devices. This is reached by an opening at the front side. It is so large in preferable embodiments, that average dimensioned notebooks can be placed in. Further embodiments particularly for a cash-desk are dimensioned larger. The device is dimensioned in a way that it can be set

up on a table or a similar underlay, in a vehicle and on the lap of the operator or the like. The requirements on its geometry are partly contradictory. The device is as small as possible in the collapsed condition, in order not to seem subjectively disturbing and bulky and enables an easy handling. On the other hand it is dimensioned at least as large as to enclose a notebook in such a manner that sufficient protection is given against environmental influences. At the same time an operator can work comfortably on a notebook and see the display completely. The invention presents the smallest possible covering with sufficient protection and good operability of the electronic devices, in particular a notebook, contained in it.

[0012] The protection device thereby offers effective protection against ambient light and the associated glare. This is reached by the fact that the equipment is covered completely by the device and light can merely penetrate by the front opening and is thus strongly decreased. In order to decrease incident light additionally the opening of a preferable embodiment of the device can be downsized by means of hinged visors, attached preferably firmly at the roof and at the side panels.

[0013] The protection device offers also protection against wetness at the floor. This is reached by an embodiment of the device, which preferably has a floor of a particularly durable and waterproof material. This is important if an underlay on which the device with the equipments to be protected is set up, e.g. on a building site, is dirty and moist.

[0014] The protection device protects against wind. It offers protection from wind, so that a notebook and documents are safely protected in the protection device against e.g. sand swirled by the wind. The protection device is also self secured against wind. An embodiment of the device comprises fastening clews, preferably rings or the like, to if necessary be able to be fastened by means of a cord or a like, e.g. to the table on that it is overlying.

[0015] The device comprises at least one, preferably gap-similar opening at the rear panel in order to enable possible necessary equipment wirings.

[0016] The protection device is easy to handle. In accordance with a particularly preferred embodiment can the equipment simply be placed inside the protection device through the front opening. In a further embodiment, which is configured without floor, the protection device can be put over the equipment. The protection device is very light weight and can be moved together with the covering and the containing equipment e.g. from a room outside to the garden.

[0017] The protection device is without assembly, partially independently self erectable, easily collapsible and transportable. In addition it is self-supporting. The protection device consists of one piece and requires therefore no assembly.

[0018] The device comprises flexible and twistable frames, which are integrated in the side panels, the roof and the floor. These frame panels are connected hinged preferably by means of a seam and can be folded flat, one above the other in a pile. The flexible frames permit that, afterwards the device can be folded by twisting the pile in three, essentially smaller, circular loops, lying one above the other. The device, folded in such a manner flat and in a circle, can now be put into a narrow textile bag. This pre-

vents it from self erecting (by tension of the integrated frames), packs it and protects it for transport. It is folded up very small and narrow, so that it can easily be packed away e.g. in the bag of a portable computer. The protection device unfolds independently back to the pile of the frame panels, as soon as it is taken out of its textile covering. Afterwards the frame panels can be folded out again to the fully upstanding configuration of the device. The protection device unfolds (erects) therefore partially independently. The integrated frames provide tension in the unfolded condition. Thus the device has the important characteristic that it is self-supporting

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. 1 is a front and left perspective view of the protection device in accordance with the present invention in its fully unfolded condition, with visors folded inside and enclosing the equipment to be protected, in this example a notebook;

[0020] FIG. 2 is a front and left perspective view of the protection device in its fully unfolded condition, with visors folded out and enclosing the notebook to be protected;

[0021] FIG. 3 is a rear, top and right perspective view of the protection device in its fully unfolded condition;

[0022] FIGS. 4A to 4D illustrate in a rear, top and right perspective and schematic view of the protection device the first phase of the folding procedure which is folding the frame panels to lying on top of one another to a pile form;

[0023] FIGS. 5A to 5F illustrate in a top and right perspective and schematic view of the protection device the second phase of the folding procedure which is twisting the pile of frame panels lying on top of one another to the completely collapsed configuration of the present invention;

[0024] FIG. 6 is a top, front perspective and schematic view of the protection device in its fully collapsed condition and packed up into a special round, narrow textile bag with zipper.

DETAILED DESCRIPTION OF THE INVENTION

[0025] Further advantages and characteristics arise as a result of the following detailed explanation of a preferable embodiment of the protection device based on the attached Figures.

[0026] FIGS. 1 and 2 show, how one equipment 10 (notebook) is placed in the protection device 1. It is well recognizable that the equipment 10 can be put through the opening 7 inside the protection device 1 on the floor 6 and can be operated and/or viewed.

[0027] The protection device 1 comprises a covering 2, which is formed preferably from fabric or foil-like materials. Further, it comprises two side panels 3, a roof 5 and a rear panel 4 shown in FIGS. 1 and 3 and preferably a floor 6. The covering 2 preferably consists of one single piece. Whereas this also means

in a broader sense that the covering 2 can be compounded from several pieces of material, if necessary also different materials, preferably sewn or glued together.

[0028] It is recognizable in FIGS. 1 and 2 furthermore that the equipment 10 in particular a notebook 10 is preferably completely covered, by the covering 2. A notebook 10 should, in order to sufficiently reduce the ambient light, be preferably so deeply positioned in the protection device 1 that it is covered entirely and in addition, an overhang is formed by the covering 2, in particular by the roof 5 and the side panels 3 at the opening 7. The overhang is meant in relation to the front outline of the notebook 10. The notebook 10 is preferably placed completely up to the rear panel 4, or as deep inside until its opened display meets the rear part of the roof 5. In a preferable embodiment, suitably in particular for notebooks with 14" to 15" displays, the overhang is approx. 10 to 20 cm, whereas the length of the floor 6 and the entire protection device 1, from the perspective of the opening 7 is approx. 50 cm. This overhang is also necessary for sufficiently protecting from light rain and other environmental influences.

[0029] FIGS. 1 and 2 show the covering 2 comprising a visor 12, which is attached preferably firmly and hinged to the opening 7. The visor has the function to partly close and/or reduce the opening 7 from above in order to additionally decrease the glare by light. The protection device 1 preferably comprises visors 13 at the side panels, in order to partly close and/or reduce the opening 7 from the sides. The upper visor 12, and the lateral visors 13 can be attached preferably removable and/or hinged foldable into the covering 2. FIG. 1 shows the visors 12 and 13 in folded inwards condition in the internal area of the protection device while FIG. 2 shows these in the folded outwards condition of a preferable embodiment. The upper visor 12, and the lateral visors 13 can preferably be adjusted and fastened by hook and loop strips, known as "Velcro strips", on different positions of the covering 2. In addition the covering 2 in a preferable embodiment of the protection device 1 comprises non adjustable visors 14, which reduce the opening 7 within the range of the upper corners, between the side panels 3 and the roof 5. This area is for the view on enclosed equipment usually not relevant.

[0030] A goal of the invention is to keep the dimensions as small as possible, so that the operation of the protection device 1 is easy and handy, while reaching all functional goals. The opening 7 is reduced up to a width and a height by which a display of a notebook 10 is completely visible while viewed from a normal operating distance. In a preferable embodiment, suitably in particular for notebooks with 14" to 15" displays and if the protection device 1 lies on a table, this is width of min. 14 cm and a height of min. 35 cm. If the device lies on the lap of the operator, the minimum height of the opening 7 is approx. 35 to 50 cm. Smaller values would prevent an average build operator, in a normal, ergonomically meaningful work arrangement, of being able to view the entire display. In order to meet this requirement, the protection device 1 points the highest spot at the roof 5, at the top margin of the opening 7.

[0031] The protection device 1 can be preferably lower at the rear panel 4 (FIGS. 2 and 3) than at the opening 7, since the height of the rear panel 4 is only limited by the height of the opened notebook display inside. In a preferable embodiment, suitably in particular for notebooks with 14" to 15" displays, this

is a height of 25 to 35 cm, in particular 29 cm. Due to these requirements result the inclination of the roof 5, from the opening 7 to the rear panel 4, in the preferable embodiment (figures 1, 2 and 3).

[0032] The width of the protection device 1 at the rear panel 4 (FIG 3) is likewise defined merely by the width of the Equipment 10, in particular a notebook 10. Cables attached to a notebook 10 should as well be considered since they also need space. In a preferable embodiment of the protection device 1, suitable in particular for notebooks with 14" to 15" displays, this results a width of the rear panel 4 approx. 30 cm to 40 cm, in particular 35 cm. The width of the opening 7 within its lower range is defined over the area needed by an operator for his arms while operating a notebook keyboard. The operator should thereby have a comfortable feeling. At this point it must be considered that a notebook 10, as previously mentioned, is placed relatively deep into the device. If the opening 7 is not broad enough, the arms of the operator tend to bump against the side panels 3 from the inside. For this reason the side panels 3 are preferably not connected with the floor 6 at their lower front round corners (FIGS. 1 and 2). In that area the ambient light has not a big impact, particularly since the arms of the operator limit the incident light. For the same reason, in a preferable embodiment, the hinged visors 13 at the opening 7 are led not along the entire height of the side panel 3, but only up to approx. 7 cm to the plane of the floor 6. In consideration of these constructional characteristics of a preferable embodiment, suitable in particular for notebooks with 14" to 15" displays, the distance of the side panels 3 to each other is in the lower range of the opening 7 approx. 35 to 45 cm, in particular 42 cm.. To lend stability to the construction in the upstanding condition, the floor 6 is in a preferable embodiment at least as wide and long as the rest of the covering 2.

[0033] The protection device 1 is very light weighted. In a preferable embodiment it weighs max. 300 g.

[0034] FIGS. 2 and 3 show the protection device 1, comprising preferably fastening clews 11, in the presented embodiment textile loops, for the fastening of the protection device 1. These can be used, if the necessity exists to fasten the protection device 1 e.g. due to wind. With the fastening clews 11 the protection device 1 can be fastened for example by means of a cord.

[0035] FIG 3 shows the protection device 1 comprising preferably gap-similar openings 17 at the rear panel 4, in order to allow the connecting of possible necessary wirings to an enclosed equipment 10 and/or for ventilation of the equipment 10. Furthermore it comprises preferably further gap-similar openings, which are built between the floor 6 and the side panels 3, and/or between the side panels 3 and the rear panel 4, preferably as interruptions of the seam.

[0036] The side panels 3, the roof 5 as well as the floor 6 are supporting panels of the construction and therefore in the following are also called frame panels 16 (FIGS. 1 and 3). The rear panel 4 is not a frame panel. The frame panels 16 may consist from the flexible materials of the covering 2 and along their edge is a seam 9 or a tubular form attached which may have the same fabric material, preferably sewn on. In this seam 9 a flexible frame 8, with closed geometry, is led and is integrated. This frame 8 keeps each of the frame panels under constant, biaxialer tension. The frame 8 is flexible in such a manner that it can be twisted in three circular loops. A special construction problem arises due to a requirement on the geome-

try of the protection device 1 to preferably provide a corner rounding with a small radius. The reason for it is that the frame 8, which is led along the edge of the frame panels 16, is bendable only limited and can not build radiuses under a certain limit. In order to build preferably as small as possible radiuses of the corner roundings, preferably max. 10 cm, of the frame panels 16 a frame 8 is used, which is preferably flat in its cross section.

[0037] Suitable material for the frame 8 is spring steel. In a preferable embodiment the frame 8 is spring steel and may be approx. 1mm wide and approx. 3 mm long in the cross section. Also plastics with similar characteristics, thus high elasticity and firmness are suitable, whereas a frame 8 from plastic can be differently dimensioned as spring steel.

[0038] The frame panels 16 are connected to one another hinged by means of preferably a seam, whereas from the perspective of FIG 1, the left edge of the floor 6 is connected with the lower edge of the side panel 3 and the top edge of the side panel 3 is connected with the left side of the roof 5 and the right edge of the roof 5 (in FIG 1 only from the inside visibly) with the top edge of the second side panel 3 and finally the lower edge of the second side panel 3 is connected (in FIG 1 only from the inside visibly) with the right edge of the floor 6 to a closed arrangement of hinged connected frame panels 16.

[0039] In order to be able to transport the protection device 1 comfortably, it is collapsible. FIGS. 4A to 4B illustrate the first phase of the practical folding procedure of folding down the frame panels 16 to lying on top of one another in a pile form. FIG. 4A shows the protection device still in the developed condition. FIG. 4B illustrates the folding of a side panel together with the roof, down towards the floor 6. Folding down is caused by light pressing of the seam and/or edge between side panel 3 and roof 5. Subsequently, the folding procedure is continued, by folding the second and/or opposite side panel 3, together with the roof 5 towards the floor 6. (FIG. 4C). All frame panels 16 lie on top of one another now and form a pile.

[0040] FIG. 5A to 5F illustrate the second phase of the folding procedure, where the pile of frame panels 16 lying on top of one another is transformed to the completely collapsed configuration by a twisting sequence. This happens by the fact that the integrated frames 8 of the frame panels 16 form, in their extended condition a single loop, which is transformed by twisting to respectively three loop sets lying one above the other and which give the fully collapsed condition of the protection device 1. FIG. 5A, 5B and 5F illustrate practically the bending of the frame panels in different snapshots. In FIG. 5D three loops are already pointed out schematically. In each hand of the operator respectively one loop and at their opposite side the third loop is respectively formed. FIG. 5E illustrates how the two loops in the hands are placed one above the other. FIG. 5F illustrates how the plane of the third loop is folded down to the plane defined of the two loops already lying one above the other.

[0041] In the completely collapsed condition the protection device 1 is flat and circular, and is under permanent tension, so that it would self expand independently. For this reason the collapsed protection device 1 is preferably pushed into a special circular, flat textile bag 15 preferably with zipper (FIG. 6).

The height of the collapsed protection device 1 is in a preferable embodiment maximally 5 cm, in particular 3 cm and the diameter maximally 25 cm, in particular 18 cm or less. All indicated dimensions of the protection device 1, both in the unfolded and in the collapsed condition, are suitable in particular for special equipment 10, in particular notebooks with of the dimension of 14" to 15" sized displays. It is self understanding that for smaller or larger or differently formed equipment 10, the dimensions of the protection device 1 will be respectively smaller or larger or different.

[0042] Suitable materials for the covering 2 are in particular waterproof, opaque, reflecting fabric material or foil. Thus an effective protection against different influences of the weather is ensured. In particular polyester or nylon fabric is suitable which may have a silver coating. For the floor 6 a PU coating is also suitable, in order to deal with the requirements of robustness and water resistance.

[0043] Although the invention has been described by reference to a specific embodiment, it should be understood that numerous changes may be made within the spirit and scope of the inventive concepts described. Accordingly, it is intended that the invention not be limited to the described embodiment, but that it have the full scope defined by the language of the following claims.